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(19)



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European Patent Office

Office européen des brevets



(11)

**EP 0 761 193 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**05.12.2001 Bulletin 2001/49**

(51) Int Cl.7: **A61F 13/15**

(21) Application number: **96305695.7**

(22) Date of filing: **01.08.1996**

**(54) Absorbent article of pants type**

Absorbierende, hosenähnliche Windel

Couche-culotte absorbante

(84) Designated Contracting States:  
**BE DE FR GB IT NL SE**

(30) Priority: **02.08.1995 JP 19773295**

(43) Date of publication of application:  
**12.03.1997 Bulletin 1997/11**

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(56) References cited:  
**EP-A- 0 641 552 WO-A-95/06451**  
**WO-A-96/11657**

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## Description

[0001] The present invention relates to an absorbent article of pants type and more particularly to a disposable absorbent article of pants type such as a diaper of pants type, incontinence pants, or training pants.

[0002] To improve the fitting of a disposable diaper to a wearer's body, it is well known, for example, from Japanese Patent Application Publication No. Hei7-44945 to provide a plurality of elastic members (referred to hereinafter as auxiliary elastic members) in respective middle regions of front and rear waist regions of the diaper between a stretchable waist-opening and a pair of stretchable leg-openings.

[0003] Generally, a baby's body form is characterized by a prominent belly. Therefore, once the waist-opening's upper edge of the diaper put on a baby's body has shifted downward beyond the apex of the baby's prominent belly as the baby moves, the diaper tends to shift further downward along the curve of the belly's prominence, often resulting in "slip down" of the diaper as a whole, even if it is not complete "slip down". Such "slip down" necessarily results in reduced fitting and causes undesirable excretion leakage.

[0004] The disposable diaper disclosed by Japanese Patent Application Publication No. Hei7-44945 mentioned hereinabove as an example of the prior art will be now considered. In this diaper, the auxiliary elastic members are concentratively distributed in the respective middle regions of the diaper's front and rear waist regions and these middle regions provided with the auxiliary elastic members will be located around the apex of the belly's prominence when the diaper is put on a baby's body. Thus, it will be difficult for these auxiliary elastic members to prevent said "slip down" and they tend to exert on the middle regions of a baby's belly an excessive pressure which may obstruct the baby's smooth abdominal breathing.

[0005] WO-A-96/11657, which is citable as state of the art under Article 54(3) EPC, discloses a shorts type disposable diaper having a plurality of elastic members in each of the waist-opening portion and the body-surrounding portion between the waist-opening portion and the leg openings. The elastic members in the body-surrounding portion are arranged such that the interval between them becomes narrower towards the waist-opening portion and that the elongation of these elastic members increases towards the waist-opening portion.

[0006] WO-A-95/06451 discloses a disposable menstrual panty having an elasticised waist and a number of body elastics provided in front and back upper body portions at positions between the waist opening and the leg openings. The panty uses higher elongation, closer spacing and higher cross-sectional area in the waist elastic than in the body elastics.

[0007] In general, the disposable diaper is provided between top- and backsheets with a liquid-absorbent core panel comprising a mixture of various materials

such as fluff obtained by crushing woody pulp fibers and superabsorptive polymer particles. The core panel is usually more or less compressed and therefore semi-rigid. With the diaper containing such liquid-absorbent core panel, desired elasticities of the elastic members provided around the waist- and leg-openings, particularly elasticities of the elastic members provided around the leg-openings, are often affected by the semi-rigid core panel so that the regions of the diaper extending in the proximity of the leg-openings may be lifted off the baby's skin and consequently cause undesirable excretion leakage.

[0008] It has been found by the inventors that the aforesaid problems can be effectively eliminated by arranging elastic members of relatively high elongation stresses in waist-opening marginal regions as well as in upper and lower subregions of the front and rear waist regions of the diaper, so that elastic members arranged in intermediate subregions of the front and rear waist regions may preferably function to hold an inner surface of the diaper in these subregions in soft but gap-free contact with the baby's skin. It has been also found that elongation stresses of the auxiliary elastic members provided on the rear waist region may be lower than those of the auxiliary elastic members provided on the front waist region of the diaper because, in view of the particular body form substantially common to babies, the rear waist region is less important than the front waist region for prevention of the aforesaid "slip down".

[0009] The invention is based on the above-mentioned findings and aims to construct an absorbent article of pants type, such as a diaper, considering the typical body form of a baby as well as functions of respective components of the articles, so that the auxiliary elastic members as well as the elongation stresses thereof may be efficiently distributed substantially all over the front and rear waist regions of the article.

[0010] Accordingly, the present invention consists in an absorbent article of pants type comprising:

a laminated panel composed of a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid-absorbent core panel disposed between said topsheet and said backsheet, said laminated panel being folded in two sections followed by bonding these two sections along transversely opposite side edges except a longitudinally intermediate region so as to define front and rear waist regions, a crotch region, a waist-opening and a pair of leg-openings, wherein there are provided first elastic means around said waist-opening so as to be circumferentially stretchable, second elastic means around each of said leg-openings so as to be circumferentially stretchable and third elastic means transversely extending between said waist-opening and said leg-openings across said core panel so as to be circumferentially stretchable; said first elastic means being arranged in front and

rear waist-opening marginal stretchable regions defined between respective upper ends of said waist-opening and respective first border lines transversely extending along respective upper ends of said core panel as viewed in said front and rear waist regions;

said third elastic means provided on said front waist region being arranged in a front waist stretchable region defined between said first border line in said front waist region and a second border line connecting respective upper portions of said pair of leg-openings; and

said first elastic means in said front waist-opening marginal stretchable region presenting an elongation stress higher than that presented by said third elastic means in said front waist stretchable region; characterised in that:

said front waist stretchable region comprises upper, intermediate and lower stretchable subregions; and said third elastic means in said upper and lower stretchable subregions presents an elongation stress higher than that presented by said third elastic means in said intermediate stretchable subregion.

**[0011]** Said third elastic means in said lower stretchable subregion may present an elongation stress substantially equal to, or, higher than, that presented by said third elastic means in said upper stretchable subregion.

**[0012]** In one embodiment, said third elastic means in said rear waist region is arranged in a rear waist stretchable region defined between said first border line and said second border line in said rear waist region connecting respective upper portions of said pair of leg-openings; said rear waist stretchable region comprises upper, intermediate and lower stretchable subregions; said first elastic means in said rear waist-opening marginal stretchable region presents an elongation stress substantially equal to that presented by said first elastic means in said front waist-opening marginal stretchable region but higher than that presented by said third elastic means in each of said upper and lower stretchable subregions of said rear waist stretchable region; said third elastic means in each of said upper and lower stretchable subregions of said rear waist stretchable region presents an elongation stress substantially equal to that presented by said third elastic means in each of said upper and lower stretchable subregions of said front waist stretchable region but higher than that presented by said third elastic means in said intermediate stretchable subregion of said rear waist stretchable region; and said third elastic means in said intermediate stretchable subregion of said rear waist stretchable region presents an elongation stress substantially equal to that presented by said third elastic means in said intermediate stretchable subregion of said front waist stretchable region.

**[0013]** Said third elastic means in said lower stretchable subregion of said rear waist stretchable region may present an elongation stress substantially equal to, or higher than, that presented by said third elastic means in said upper stretchable subregion of said rear waist stretchable region.

**[0014]** Alternatively, said third elastic means in said rear waist stretchable region may present an elongation stress substantially uniform all over said rear waist stretchable region but lower than that presented by said third elastic means in said lower stretchable subregion of said front waist stretchable region.

**[0015]** Each of said upper, intermediate and lower stretchable subregions of said front waist stretchable region may comprise at least a single elastic element as said third elastic means. The number of elastic elements constituting said third elastic means in said rear waist stretchable region may be less than the number of elastic elements constituting said third elastic means in said front waist stretchable region.

**[0016]** Alternatively, said third elastic means in said upper, intermediate and lower stretchable subregions of said front and/or rear waist stretchable region may be formed by a single sheet.

**[0017]** The invention will now be described by way of example with reference to the accompanying drawings, wherein:-

Fig. 1 is a perspective view, partially broken away, of a disposable diaper as an example of an absorbent article of pants type according to one embodiment of the invention;

Fig. 2 is a plan view showing an arrangement of elastic means as a laminated panel constituting the diaper being unfolded;

Fig. 3 is a view similar to Fig. 2, showing an alternative arrangement of the elastic means;

Fig. 4 is a fragmentary plan view showing another type of the elastic means; and

Fig. 5 is a view similar to Fig. 4, showing still another type of the elastic members.

**[0018]** Referring to Figs. 1 and 2, a diaper has a rectangular laminated panel 13 comprising a liquid-permeable topsheet 10, a liquid-impermeable backsheet 11 and an hourglass-shaped liquid-absorbent core panel 12 disposed between these top and backsheets 10, 11. In the laminated panel 13, the top and backsheets 10, 11 are bonded to each other at their portions extending outward beyond an outer peripheral edge of the core panel 12 so as to form longitudinally opposite end flaps 14a, 14b as well as transversely opposite side flaps 15a, 15b. The side flaps 15a, 15b have, over their longitudinally middle portions, cutouts 16a, 16b describing circu-

lar arcs along respective outer side edge portions of the side flaps 15a, 15b and these cutouts 16a, 16b form respective leg-openings.

[0019] The laminated panel 13 may be divided into a front waist region 17, a rear waist region 18 and a crotch region 19 longitudinally extending between the front and rear waist regions 17, 18. The laminated panel 13 is folded in two sections with the topsheet 10 inside and transversely opposite side edges 20a, 20b of the front and rear waist regions 17, 18 are intermittently ultrasonic-welded together in the longitudinal direction to obtain the desired diaper of pants type having a waist-opening 21 and a pair of leg-openings 22a, 22b.

[0020] The diaper has front and rear waist-opening marginal stretchable regions 23a, 23b as well as front and rear waist stretchable regions 24a, 24b. The front and rear waist-opening marginal stretchable regions 23a, 23b are defined between respective upper ends 25 of the waist-opening 21 and respective border lines 26 transversely extending along respective longitudinally opposite ends of the core panel 12 in the front and rear waist regions 17, 18. The front and rear waist stretchable regions 24a, 24b are defined between the respective border lines 26 and respective border lines 27 connecting points adjacent respective upper ends of the leg-openings 22a, 22b. Each of the front and rear waist stretchable regions 24a or 24b comprises upper, intermediate and lower stretchable subregions 28a, 28b, 28c respectively dimensioned to have their width substantially equal to 1/3 of the front or rear waist stretchable region 24a or 24b. While it is not critical for the stretchable subregions 28a, 28b, 28c to have their widths (i.e. their dimensions as selected longitudinally of the article) substantially uniform, these stretchable subregions 28a, 28b, 28c are preferably adjusted, in this order, so as to extend over an upper zone, an intermediate zone (corresponding to the prominence apex) and a lower zone of a baby's prominent belly. Additionally, each of the stretchable subregions 28b is preferably dimensioned to have a width larger than both the stretchable subregions 28a, 28c so that a pressure exerted on the baby's belly may be alleviated.

[0021] The front and rear waist-opening marginal stretchable regions 23a, 23b as well as the front and rear waist stretchable regions 24a, 24b have, at least on an inner surface of the backsheet 11, elastic members 29, 30 each comprising a plurality of elastic threads bonded thereon under the tension of a desired elongation percentage so as to be capable of expansion and contraction circumferentially of the front and rear waist regions 17, 18. In the specific embodiment illustrated, the front and rear waist-opening marginal stretchable regions 23a, 23b have four elastic threads 29, respectively, and the front and rear waist stretchable regions 24a, 24b have three elastic threads 30 on the upper, intermediate and lower stretchable subregions 28a, 28b, 28c, respectively. However, it should be understood that the number of the elastic threads 29, 30 may be respec-

tively at least one and preferably two to eight. If it is desired, a plurality of elastic threads 30 may be additionally provided on areas extending below the border lines 27. Longitudinal elongation stresses presented by the elastic member 29 in the front and rear waist-opening marginal stretchable regions 23a, 23b and the elastic member 30 on the upper, intermediate and lower stretchable subregions 28a, 28b, 28c of the front and rear waist stretchable regions 24a, 24b are as follows:

[0022] The stretchable region 23a  $\approx$  the stretchable region 23b.

[0023] The stretchable subregion 28a of the stretchable region 24a  $\approx$  the stretchable subregion 28a of the stretchable region 24b.

[0024] The stretchable subregion 28b of the stretchable region 24a  $\approx$  the stretchable subregion 28b of the stretchable region 24b.

[0025] The stretchable subregion 28c of the stretchable region 24a  $\approx$  the stretchable subregion 28c of the stretchable region 24b.

[0026] The stretchable region 23a (or 23b)  $>$  the stretchable subregion 28a or 28c of the stretchable region 24a (or 24b).

[0027] The stretchable subregion 28a or 28c of the stretchable region 24a (or 24b)  $>$  the stretchable subregion 28b of the stretchable region 24a (or 24b).

[0028] The stretchable subregion 28c of the stretchable region 24a (or 24b)  $>$  the stretchable subregion 28a of the stretchable region 24a (or 24b), or the stretchable subregion 28c of the stretchable region 24a (or 24b)  $\approx$  the stretchable subregion 28a of the stretchable region 24a (or 24b).

[0029] Most preferably, the stretchable region 23a (23b)  $>$  the stretchable subregion 28c  $>$  the stretchable subregion 28a  $>$  the stretchable subregion 28b.

[0030] The aforesaid elongation stresses may be determined, for example, with samples of desired lengths and widths cut off the respective stretchable regions and subregions 23a, 23b, 28a, 28b, 28c of the diaper illustrated and elongated at desired elongation percentages, respectively. Of these elongation stress values determined in this manner, those values for the waist-opening marginal stretchable regions 23a, 23b are used as the basic values which are, in general, selected to be substantially equal to those in the diaper of pants type. For example, assuming that the elongation stresses are in a relationship of the stretchable region 23a  $>$  the stretchable subregion 28c  $>$  the stretchable subregion 28a  $>$  the stretchable subregion 28b, an arrangement will be preferable such that the elongation stress in the stretchable subregion 28c corresponds to approximately 60 to 80% of that in the stretchable region 23a, approximately 150 to 250% of that in the stretchable subregion 28a and approximately 250 to 350% of that in the stretchable subregion 28b which corresponds, in turn, to approximately 5 to 85% of that in the stretchable subregion 28a.

[0031] Such differences in the elongation stress are easily obtained by appropriately differentiating various

factors such as the number; the nature of raw material, the cross-section and the elongation percentage for the respective elastic elements 29, 30 when they are applied to the diaper.

[0032] The embodiment shown by Fig. 3 is similar to the embodiment which has been described in connection with Figs. 1 and 2 so far as the number, the elongation stress and the spacing for placement of the elastic elements 29 in the front and rear waist-opening marginal stretchable regions 23a, 23b as well as of the elastic elements 30 in the front waist stretchable region 24a are concerned, but different from the embodiment of Figs. 1 and 2 with respect to the number, the elongation stress and the spacing for placement of the elastic elements 30 in the rear waist stretchable region 24b. More specifically, the elongation stress of the elastic member 30 in the rear waist stretchable region 24b is adjusted to be less than in the stretchable subregion 28c of the front waist stretchable region 24a.

[0033] The leg-openings 22a, 22b or the cutouts 16a, 16b to form the respective leg-openings 22a, 22b have, at least on an inner surface of the backsheet 11, elastic members 31 each comprising a plurality of elastic threads bonded thereto under the tension of a desired elongation percentage circumferentially of the leg-openings 22a, 22b or along the curves of the cutouts 16a, 16b, respectively.

[0034] The waist-opening marginal stretchable regions 23a, 23b and the upper stretchable subregion 28a of the front waist stretchable region 24a extend over the upper region of a baby's belly so as to hold an inner surface of the diaper against this region with a relatively high tightness and thereby to prevent "slip down" of the diaper. The upper stretchable subregion 28a additionally serves to prevent a region of the diaper extending in the proximity of the upper end of the core panel 12 from being lifted off the baby's skin due to a relatively high rigidity of the panel 12. The intermediate stretchable subregion 28b of the front waist stretchable region 24a extends over a region of the baby's belly in the proximity of its prominence apex and is brought in relatively soft contact with said region so as to prevent the inner surface of the diaper on this region from being lifted off from a baby's skin without obstructing the baby's smooth abdominal breathing. The lower stretchable subregion 28c of the front waist stretchable region 24a extends over a lower region of the baby's belly not only to hold the inner surface of the diaper against this region with a relatively high tightness and thereby to prevent "slip down" of the diaper but also to avoid an apprehension that the inner surface of the diaper in the proximity of the upper ends of the respective leg-openings 22a, 22b might be lifted off the baby's skin due to a relatively high rigidity of the core panel 12 whereby a gap might be formed between the inner surface of the diaper and the baby's skin which causes excretion leakage. While the aforesaid function of the front waist stretchable region 24a is really achieved in cooperation with the rear waist stretchable

region 24b, it should be understood that said function of the front waist stretchable region 24a has been considered independently of the rear waist stretchable region 24b, since, in view of a baby's particular body form, more importance should be attached to the front waist stretchable region 24a than the rear waist stretchable region 24b in order to solve the problems of "slip down" and excretion leakage.

[0035] The elastic members 29, 30 are bonded between the top-and backsheet 10, 11 by means of well known hot melt adhesive and, more preferably, by means of such adhesive having an elasticity in its cured state. While opposite ends of the elastic members 30 in the stretchable subregions 28c intersect opposite ends of the elastic members 31 according to the embodiments illustrated, it is obviously possible to arrange the elastic members 30, 31 without intersecting in this manner. However, the elastic members 30, 31 are preferably arranged so that said intersection occurs, since the elastic member 30 has a relatively high density in the regions involving such intersection and contributes to improvement of the diaper's fitting to the baby's skin.

[0036] According to an alternative arrangement of the elastic member 30 shown by Fig. 4, the elastic threads are replaced by tape-like elastic elements and each of the stretchable subregions 28a, 28b, 28c has a single tape-like elastic element. Alternatively, as shown in Fig. 5, the stretchable subregions 28a, 28b, 28c may be formed by a single sheet having subregions 32a, 32b, 32c presenting elongation stresses corresponding to those of the aforesaid stretchable subregions 28a, 28b, 28c. Such sheet can be obtained by regulating an amount of discharged fibers so that the subregions 32b which should have a relatively low elongation stress may be formed with a weight per unit area less than those of the other subregions during a process of manufacturing an elastic melt blown nonwoven fabric.

[0037] Well known materials which have conventionally been employed to make the diaper of pants type may be employed for the components of the invention such as the top- and backsheet 10, 11, the core panel 12, and the elastic members 29, 30, 31.

[0038] The article according to the invention not only does not obstruct a baby's smooth abdominal breathing but also effectively prevents the aforesaid "slip down" of the article and therefore excretion leakage during use of the article, since, in view of the prominent belly and the abdominal breathing characteristics of babies, the elastic members are arranged in the front and rear waist stretchable regions in the manner as described in the appended Claims.

## Claims

1. An absorbent article of pants type comprising:

a laminated panel (13) composed of a liquid-

permeable topsheet (10), a liquid-impermeable backsheet (11) and a liquid-absorbent core panel (12) disposed between said topsheet (10) and said backsheet (11), said laminated panel (13) being folded in two sections followed by bonding these two sections along transversely opposite side edges except a longitudinally intermediate region so as to define front and rear waist regions (17, 18), a crotch region (19), a waist-opening (21) and a pair of leg-openings (22a, 22b), wherein there are provided first elastic means (29) around said waist-opening (21) so as to be circumferentially stretchable, second elastic means (31) around each of said leg-openings (22a, 22b) so as to be circumferentially stretchable and third elastic means (30) transversely extending between said waist-opening (21) and said leg-openings (22a, 22b) across said core panel (12) so as to be circumferentially;

said first elastic means (29) being arranged in front and rear waist-opening marginal stretchable regions (23a, 23b) defined between respective upper ends (25) of said waist-opening (21) and respective first border lines (26) transversely extending along respective upper ends of said core panel (12) as viewed in said front and rear waist regions (17, 18);

said third elastic means (30) provided on said front waist region (17) being arranged in a front waist stretchable region (24a) defined between said first border line (26) in said front waist region (17) and a second border line (27) connecting respective upper portions of said pair of leg-openings (22a, 22b); and

said first elastic means (29) in said front waist-opening marginal stretchable region (23a) presents an elongation stress higher than that presented by said third elastic means (30) in said front waist stretchable region (24a); **characterised in that:**

said front waist stretchable region (24a) comprises upper, intermediate and lower stretchable subregions (28a, 28b, 28c); and said third elastic means (30) in said upper and lower stretchable subregions (28a, 28c) presents an elongation stress higher than that presented by said third elastic means (30) in said intermediate stretchable subregion (28b).

2. The article according to Claim 1, wherein said third elastic means (30) in said lower stretchable subregion (28c) presents an elongation stress higher than that presented by said third elastic means (30) in said upper stretchable subregion (28a).

3. The article according to Claim 1, wherein said third elastic means (30) in said lower stretchable subregion (28c) presents an elongation stress substantially equal to that presented by said third elastic means (30) in said upper stretchable subregion (28a).

4. The article according to Claim 1, 2 or 3, wherein said third elastic means (30) in said rear waist region (18) is arranged in a rear waist stretchable region (24b) defined between said first border line (26) and said second border line (27) in said rear waist region (18) connecting respective upper portions of said pair of leg-openings (22a, 22b);

said rear waist stretchable region (24b) comprises upper, intermediate and lower stretchable subregions (28a, 28b, 28c);

said first elastic means (29) in said rear waist-opening marginal stretchable region (23b) presents an elongation stress substantially equal to that presented by said first elastic means (29) in said front waist-opening marginal stretchable region (23a) but higher than that presented by said third elastic means (30) in each of said upper and lower stretchable subregions (28a, 28c) of said rear waist stretchable region (24b);

said third elastic means (30) in each of said upper and lower stretchable subregions (28a, 28c) of said rear waist stretchable region (24b) presents an elongation stress substantially equal to that presented by said third elastic means (30) in each of said upper and lower stretchable subregions (28a, 28c) of said front waist stretchable region (24a) but higher than that presented by said third elastic means (30) in said intermediate stretchable subregion (28b) of said rear waist stretchable region (24b); and

said third elastic means (30) in said intermediate stretchable subregion (28b) of said rear waist stretchable region (24b) presents an elongation stress substantially equal to that presented by said third elastic means (30) in said intermediate stretchable subregion (28b) of said front waist stretchable region (24a).

5. The article according to Claim 4, wherein said third elastic means (30) in said lower stretchable subregion (28c) of said rear waist stretchable region (24b) presents an elongation stress higher than that presented by said third elastic means (30) in said upper stretchable subregion (28a) of said rear waist stretchable region (24b).
6. The article according to Claim 4, wherein said third elastic means (30) in said lower stretchable subregion (28c) of said rear waist stretchable region (24b) presents an elongation stress substantially equal to that presented by said third elastic means (30) in said upper stretchable subregion (28a) of said rear waist stretchable region (24b).



gion (28c) of said rear waist stretchable region (24b) presents an elongation stress substantially equal to that presented by said third elastic means (30) in said upper stretchable subregion (28a) of said rear waist stretchable region (24b).

7. The article according to Claim 4, wherein said third elastic means (30) in said rear waist stretchable region (24b) presents an elongation stress substantially uniform all over said rear waist stretchable region (24b) but lower than that presented by said third elastic means (30) in said lower stretchable subregion (28c) of said front waist stretchable region (24a).

8. The article according to any preceding Claim, wherein each of said upper, intermediate and lower stretchable subregions (28a, 28b, 28c) of said front waist stretchable region (24a) comprises at least a single elastic element as said third elastic means (30).

9. The article according to any preceding Claim, wherein the number of elastic elements constituting said third elastic means (30) in said rear waist stretchable region (24b) is less than the number of elastic elements constituting said third elastic means (30) in said front waist stretchable region (24a).

10. The article according to any preceding Claim, wherein said third elastic means (30) in said upper, intermediate and lower stretchable subregions (28a, 28b, 28c) of said front waist stretchable region (24a) are formed by a single sheet.

11. The article according to any one of Claims 4 to 7, wherein said third elastic means (30) in said upper, intermediate and lower stretchable subregions (28a, 28b, 28c) of said rear waist stretchable region (24b) are formed by a single sheet.

#### Patentansprüche

1. Absorbierende, hosenähnliche Windel, umfassend

eine laminierte Bahn (13), die eine flüssigkeitsdurchlässige Oberschicht (10), eine flüssigkeitsundurchlässige Unterschicht (11) und eine flüssigkeitsabsorbierende Kernbahn (12), die zwischen der Oberschicht (10) und der Unterschicht (11) angeordnet ist, aufweist, wobei die laminierte Bahn (13) in zwei Abschnitte gefaltet wird und diese beiden Abschnitte dann bis auf eine längliche Zwischenregion entlang quer-verlaufender gegenüberliegender Seitenkanten miteinander verbunden werden, um einen

vorderen und einen hinteren Taillenbereich (17, 18), einen Schrittbereich (19), eine Taillenöffnung (21) und ein Paar Beinöffnungen (22a, 22b) zu bilden, wobei ein erstes elastisches Mittel (29) rund um die Taillenöffnung (21), so dass diese umfangsmäßig dehnbar ist, ein zweites elastisches Mittel (31) rund um die Beinöffnungen (22a, 22b), so dass diese umfangsmäßig dehnbar sind, und ein drittes elastisches Mittel (30), das sich zwischen der Taillenöffnung (21) und den Beinöffnungen (22a, 22b) quer über die Kernbahn (12) erstreckt, um umfangsmäßig zu verlaufen, vorgesehen sind, wobei das erste elastische Mittel (29) in vorderen und hinteren dehnbaren Randbereichen (23a, 23b) der Taillenöffnung angeordnet ist, die zwischen den jeweiligen oberen Enden (25) der Taillenöffnung (21) und den jeweiligen ersten Grenzlinien (26), die sich entlang den jeweiligen oberen Enden der Kernbahn (12) quer erstrecken, wie es in den vorderen und hinteren Taillenbereichen (17, 18) zu sehen ist, definiert sind;

wobei das dritte elastische Mittel (30), das am vorderen Taillenbereich (17) vorgesehen ist, in einem vorderen dehnbaren Taillenbereich (24a) angeordnet ist, der zwischen der ersten Grenzlinie (26) im vorderen Taillenbereich (17) und einer zweiten Grenzlinie (27), welche die jeweiligen oberen Abschnitte des Paares der Beinöffnungen (22a, 22b) verbinden, definiert ist; und

wobei das erste elastische Mittel (29) im vorderen dehnbaren Randbereich (23a) der Taillenöffnung eine Dehnungsbelastung anbietet, die größer ist als jene, die vom dritten elastischen Mittel (30) im vorderen dehnbaren Taillenbereich (24a) angeboten wird, **dadurch gekennzeichnet, dass:**

der vordere dehnbare Taillenbereich (24a) obere, zwischenliegende und untere dehnbare Unterbereiche (28a, 28b, 28c) umfaßt und dass das dritte elastische Mittel (30) in den oberen und unteren dehnbaren Unterbereichen (28a, 28b, 28c) eine Dehnungsbelastung anbietet, die höher ist als jene, die von dem dritten elastischen Mittel (30) in dem zwischenliegenden dehnbaren Unterbereich (28b) angeboten wird.

2. Windel nach Anspruch 1, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) im unteren dehnbaren Unterbereich (28c) eine Dehnungsbelastung anbietet, die höher ist als jene, die vom dritten elastischen Mittel (30) im oberen dehnbaren Unterbereich (28a) angeboten wird.

3. Windel nach Anspruch 1, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) im unteren dehnbaren Unterbereich (28c) eine Dehnungsbelastung anbietet, die höher ist als jene, die vom dritten elastischen Mittel (30) im oberen dehnbaren Unterbereich (28a) angeboten wird.

ren dehnbaren Unterbereich (28c) eine Dehnungsbelastung anbietet, die im Wesentlichen gleich derjenigen ist, die vom dritten elastischen Mittel (30) im oberen dehnbaren Unterbereich (28a) angeboten wird.

4. Windel nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) in dem hinteren Taillenbereich (18) in einem hinteren dehnbaren Taillenberg (24b) angeordnet ist, der zwischen der ersten Grenzlinie (26) und der zweiten Grenzlinie (27) in dem hinteren Taillenberg (18), welche Linien die jeweiligen oberen Abschnitte des Paares der Beinöffnungen (22a, 22b) verbinden, definiert ist;

dass der hintere dehnbare Taillenberg (24b) obere, zwischenliegende und untere dehnbare Unterbereiche (28a, 28b, 28c) umfaßt;

dass das erste elastische Mittel (29) im hinteren dehnbaren Randbereich (23b) der Taillenöffnung eine Dehnungsbelastung anbietet, die im Wesentlichen gleich derjenigen ist, die vom ersten elastischen Mittel (29) im vorderen dehnbaren Randbereich (23a) der Taillenöffnung angeboten wird, aber größer ist als jene, die vom dritten elastischen Mittel (30) sowohl im oberen als auch im unteren dehnbaren Unterbereich (28a, 28c) des hinteren dehnbaren Taillenger (24b) angeboten wird;

dass das dritte elastische Mittel (30) sowohl im oberen als auch im unteren dehnbaren Unterbereich (28a, 28c) des hinteren dehnbaren Taillenger (24b) eine Dehnungsbelastung anbietet, die im Wesentlichen gleich derjenigen ist, die vom dritten elastischen Mittel (30) sowohl im oberen als auch im unteren dehnbaren Unterbereich (28a, 28c) des vorderen dehnbaren Taillenger (24a) angeboten wird, jedoch größer ist als jene, die vom dritten elastischen Mittel (30) im zwischenliegenden dehnbaren Unterbereich (28b) des hinteren dehnbaren Taillenger (24b) erzeugt wird; und dass das dritte elastische Mittel (30) im zwischenliegenden dehnbaren Unterbereich (28b) des hinteren dehnbaren Taillenger (24b) eine Dehnungsbelastung anbietet, die im Wesentlichen derjenigen ist, die vom dritten elastischen Mittel (30) im zwischenliegenden dehnbaren Unterbereich (28b) des vorderen dehnbaren Taillenger (24a) angeboten wird.

5. Windel nach Anspruch 4, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) im unteren dehnbaren Unterbereich (28c) des hinteren dehnbaren Taillenger (24b) eine Dehnungsbelastung erzeugt, die höher ist als jene, die vom dritten elastischen Mittel (30) im oberen dehnbaren Unterbereich (28a) des hinteren dehnbaren Taillenger (24b) erzeugt wird.

bereich (28a) des hinteren dehnbaren Taillenger (24b) erzeugt wird.

6. Windel nach Anspruch 4, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) im unteren dehnbaren Unterbereich (28c) des hinteren dehnbaren Taillenger (24b) eine Dehnungsbelastung erzeugt, die im Wesentlichen gleich derjenigen ist, die vom dritten elastischen Mittel (30) im oberen dehnbaren Unterbereich (28a) des hinteren dehnbaren Taillenger (24b) angeboten wird.
7. Windel nach Anspruch 4, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) im hinteren dehnbaren Taillenger (24b) eine Dehnungsbelastung anbietet, die im Wesentlichen über dem gesamten hinteren dehnbaren Taillenger (24b) gleich ist, aber kleiner ist als jene, die vom dritten elastischen Mittel (30) im unteren dehnbaren Unterbereich (28c) des vorderen dehnbaren Taillenger (24a) angeboten wird.
8. Windel nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** sowohl der obere als auch der zwischenliegende und der untere Unterbereich (28a, 28b, 28c) des vorderen dehnbaren Taillenger (24a) mindestens ein elastisches Element als drittes elastisches Mittel (30) umfassen.
9. Windel nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Anzahl der elastischen Elemente, die das dritte elastische Mittel (30) im hinteren dehnbaren Taillenger (24b) bilden, kleiner ist als die Anzahl der elastischen Elemente, aus denen das dritte elastische Mittel (30) im vorderen dehnbaren Taillenger (24a) bilden.
10. Windel nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) im oberen, zwischenliegenden und unteren Unterbereich (28a, 28b, 28c) des vorderen dehnbaren Taillenger (24a) aus einer einzelnen Folie hergestellt ist.
11. Windel nach einem der Ansprüche 4 bis 7, **dadurch gekennzeichnet, dass** das dritte elastische Mittel (30) im oberen, zwischenliegenden und unteren Unterbereich (28a, 28b, 28c) des hinteren dehnbaren Taillenger (24b) aus einer einzelnen Folie hergestellt ist.

## Revendications

1. Article absorbant du type slip comprenant :

un pan laminé (13) constitué d'une feuille su-

périeure perméable au liquide (10), une feuille arrière imperméable au liquide (11) et un pan de noyau absorbant le liquide (12) disposé entre ladite feuille supérieure (10) et ladite feuille arrière (11), ledit pan laminé (13) étant plié en deux sections puis ces deux sections sont liées le long de bords latéraux transversalement opposés excepté au niveau d'une région longitudinalement intermédiaire de manière à définir des régions de ceinture avant et arrière (17, 18), une région d'entre-jambes (19), une ouverture de ceinture (21) et une paire d'ouvertures de jambes (22a, 22b), dans lequel il est prévu des premiers moyens élastiques (29) autour de ladite ouverture de ceinture (21) de manière à être circonférentiellement extensible, des seconds moyens élastiques (31) autour de chacune desdites ouvertures de jambes (22a, 22b) de manière à être circonférentiellement extensibles et des troisièmes moyens élastiques (30) s'étendant transversalement entre ladite ouverture de ceinture (21) et lesdites ouvertures de jambes (22a, 22b) à travers ledit pan de noyau (12) de manière à être circonférentiel ; lesdits premiers moyens élastiques (29) étant arrangés dans des régions extensibles marginales d'ouverture de ceinture avant et arrière (23a, 23b) définies entre des extrémités supérieures respectives (25) de ladite ouverture de ceinture (21) et des premières lignes de lisières respectives (26) s'étendant transversalement le long d'extrémités supérieures respectives dudit pan de noyau (12) lorsque l'on regarde dans lesdites régions de ceinture avant et arrière (17, 18);

lesdits troisièmes moyens élastiques (30) prévus sur ladite région de ceinture avant (17) étant arrangés dans une région extensible de ceinture avant (24a) définie entre ladite première ligne de lisière (26) dans ladite région de ceinture avant (17) et une seconde ligne de lisière (27) connectant des parties supérieures respectives de ladite paire d'ouvertures de jambes (22a, 22b) ; et

lesdits premiers moyens élastiques (29) dans ladite région extensible marginale d'ouverture de ceinture avant (23a) présentent une résistance à l'élongation supérieure à celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite région extensible de ceinture avant (24a) ; **caractérisé en ce que :**

ladite région extensible de ceinture avant (24a) comprend des sous-régions extensibles supérieure, intermédiaire et inférieure (28a, 28b, 28c); et lesdits troisièmes moyens élastiques (30) dans lesdites sous-régions extensibles supérieures et

inférieures (28a, 28c) présentent une résistance à l'élongation supérieure que celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible intermédiaire (28b).

2. Article selon la revendication 1, dans lequel lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible inférieure (28c) présente une résistance à élongation supérieure que celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible supérieure (28a).

3. Article selon la revendication 1, dans lequel lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible inférieure (28c) présente une résistance à élongation sensiblement égale à celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible supérieure (28a).

4. Article selon la revendication 1, 2 ou 3, dans lequel lesdits troisièmes moyens élastiques (30) dans ladite région de ceinture arrière (18) sont arrangés dans une région extensible de ceinture arrière (24b) définie entre ladite première ligne de lisière (26) et ladite seconde ligne de lisière (27) dans ladite région de ceinture arrière (18) connectant des parties supérieures respectives de ladite paire d'ouverture de jambes (22a, 22b) ;

ladite région extensible de ceinture arrière (24b) comprenant des sous-régions extensibles supérieure, intermédiaire et inférieure (28a, 28b, 28c);

lesdits premiers moyens élastiques (29) dans ladite région extensible marginale d'ouverture de ceinture arrière (23b) présentent une résistance à l'élongation sensiblement égale à celle conférée par lesdits premiers moyens élastiques (29) dans ladite région extensible marginale d'ouverture de ceinture avant (23a) mais supérieure à celle conférée par lesdits troisièmes moyens élastiques (30) dans chacune desdites sous-régions extensibles supérieures et inférieures (28a, 28c) dans ladite région extensible de ceinture arrière (24b) ;

lesdits troisièmes moyens élastiques (30) dans chacune desdites sous-régions extensibles supérieure et inférieure (28a, 28c) de ladite région extensible de ceinture arrière (24b) présentent une résistance à l'élongation sensiblement égale à celle conférée par lesdits troisièmes moyens élastiques (30) dans chacune desdites sous-régions extensibles supérieures et inférieures (28a, 28c) dans ladite région extensible de ceinture avant (24a) mais supérieure à celle

conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible intermédiaire (28b) de ladite région extensible de ceinture arrière (24b); et

lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible intermédiaire (28b) de ladite région extensible de ceinture arrière (24b) présentent une résistance à l'élongation sensiblement égale à celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible intermédiaire (28b) de ladite région extensible de ceinture avant (24a).

5. Article selon la revendication 4, dans lequel lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible inférieure (28c) de ladite région extensible de ceinture arrière (24b) présentent une résistance à l'élongation supérieure à celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible supérieure (28a) de ladite région extensible de ceinture arrière (24b).

6. Article selon la revendication 4, dans lequel lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible inférieure (28c) de ladite région extensible de ceinture arrière (24b) présentent une résistance à l'élongation sensiblement égale à celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible supérieure (28a) de ladite région extensible de ceinture arrière (24b).

7. Article selon la revendication 4, dans lequel lesdits troisièmes moyens élastiques (30) dans ladite région extensible de ceinture arrière (24b) présentent une résistance à l'élongation sensiblement uniforme sur toute la région extensible de ceinture arrière (24b) mais inférieure à celle conférée par lesdits troisièmes moyens élastiques (30) dans ladite sous-région extensible inférieure (28c) de ladite région extensible de ceinture avant (24a).

8. Article selon l'une quelconque des revendications précédentes, dans lequel chacune desdites sous-régions extensibles supérieure, intermédiaire et inférieure (28a, 28b, 28c) de ladite région extensible de ceinture avant (24a) comprend au moins un élément élastique unique en tant que troisièmes moyens élastiques (30).

9. Article selon l'une quelconque des revendications précédentes, dans lequel le nombre d'éléments élastiques constituant lesdits troisièmes moyens élastiques (30) dans la région extensible de ceinture arrière (24b) est inférieur au nombre d'éléments élastiques constituant lesdits troisièmes moyens élastiques (30) dans ladite région extensible de

ceinture avant (24a).

10. Article selon l'une quelconque des revendications précédentes, dans lequel lesdits troisièmes moyens élastiques (30) dans lesdites sous-régions extensibles supérieure, intermédiaire et inférieure (28a, 28b, 28c) de ladite région extensible de ceinture avant (24a) sont formés par une feuille unique.

11. Article selon l'une quelconque des revendications 4 à 7, dans lequel lesdits troisièmes moyens élastiques (30) dans lesdites sous-régions extensibles supérieure, intermédiaire et inférieure (28a, 28b, 28c) de ladite région extensible de ceinture arrière (24b) sont formés par une feuille unique.

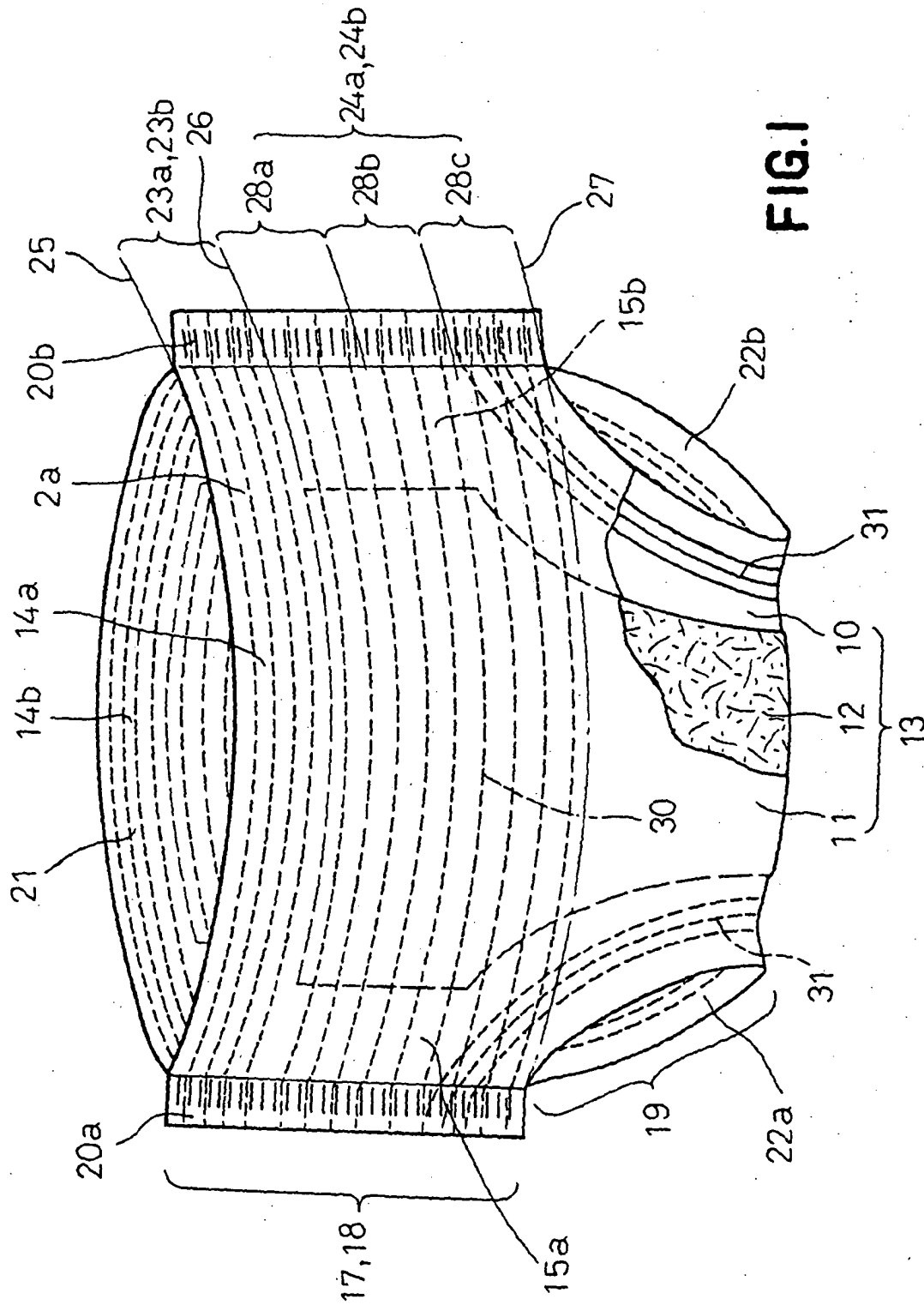


FIG. 1

FIG. 2

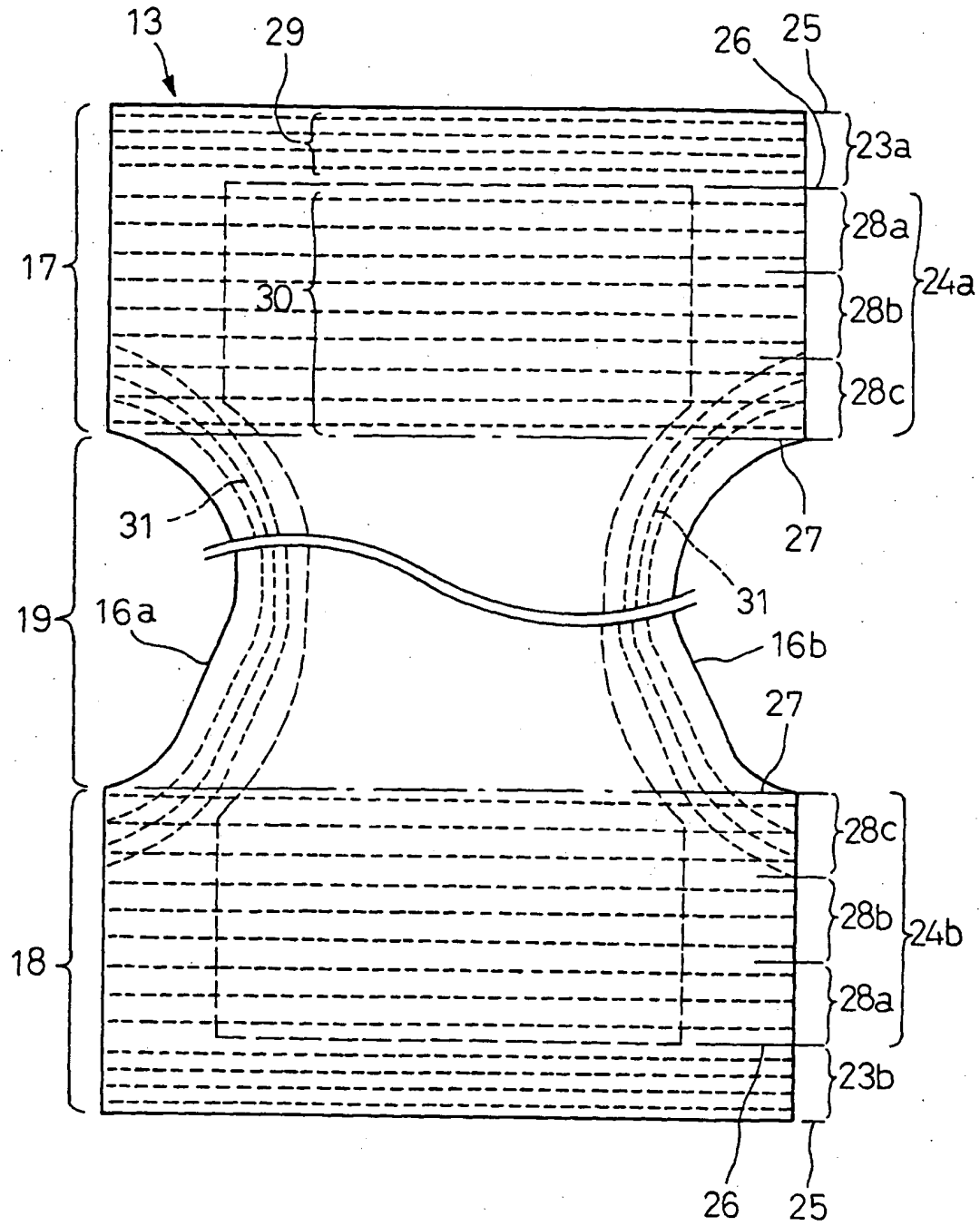
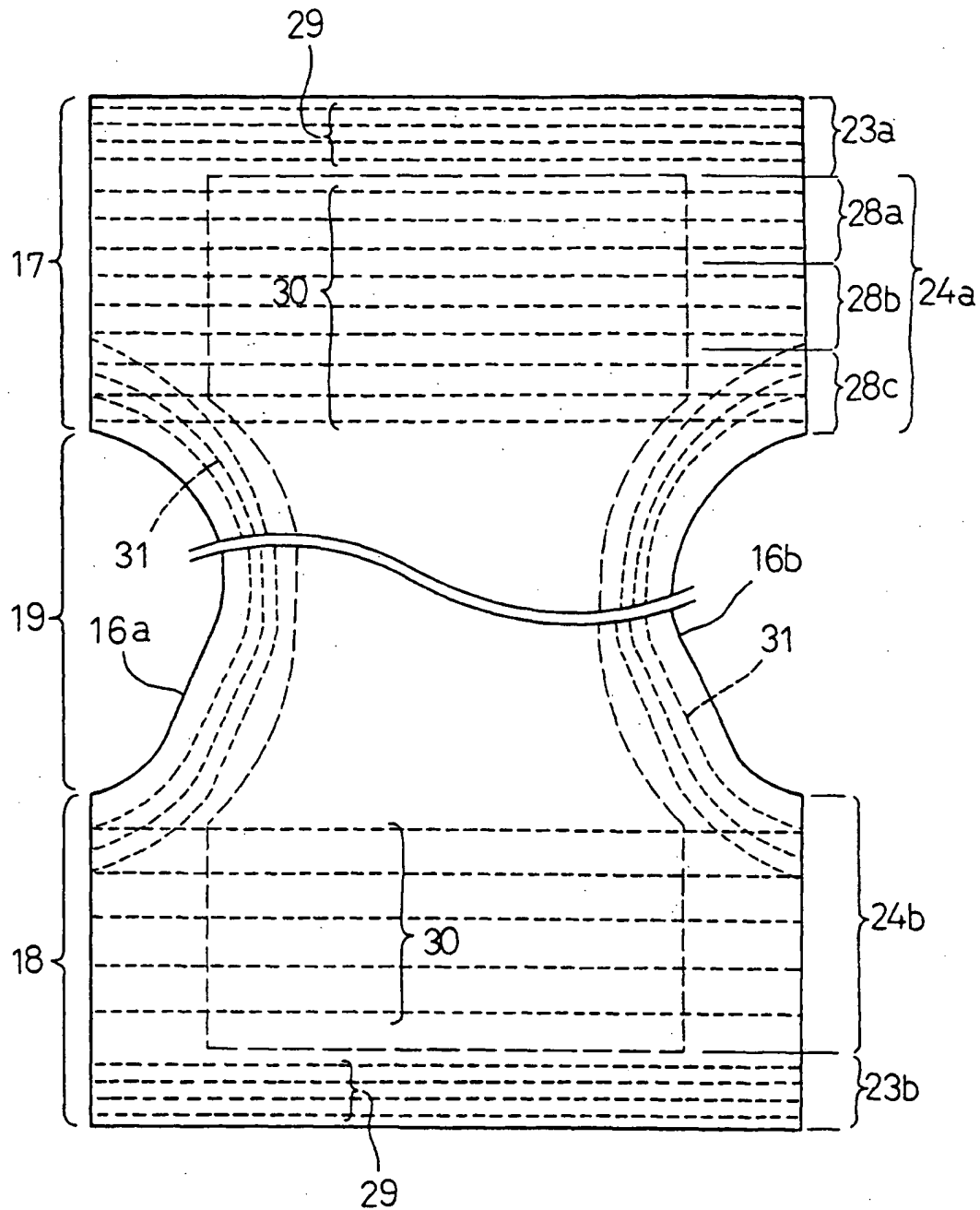
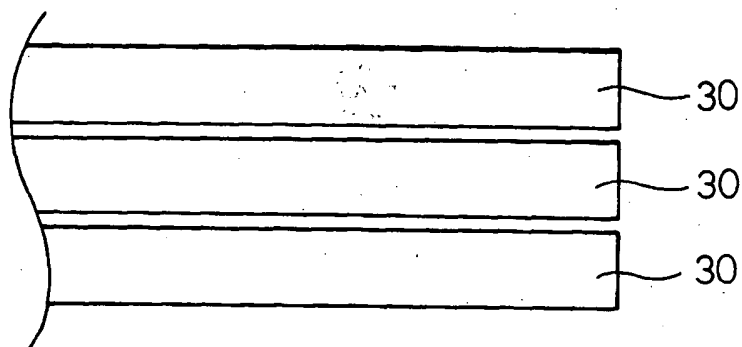


FIG.3



**FIG.4**



**FIG.5**

